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(54) RESIN COMPOSITION FOR HOT MELT BONDING OF EXCELLENT HEAT RESISTANCE AND NONWOVEN FABRIC PREPARED BY USING SAME AS ADHESIVE COMPONENT

(57)Abstract:
PURPOSE: To obtain a resin composition which can easily perform hot melt bonding and is excellent in heat stability and heat resistance by performing specified melt mixing so that the obtained mixture may have a high melting peak temperature and a specified difference between the extrapolated final melting temperature and the extrapolated initial melting temperature.
CONSTITUTION: The resin composition which can easily perform hot melt bonding and is excellent in heat stability and heat resistance is prepared by melt-mixing a random copolyester of a melting peak temperature of 200-230°C (e.g. a copolymer based on terephthalic acid and ethylene glycol and prepared by copolymerizing an acid component such as isophthalic acid with an alcohol component such as butanediol) with a polyester of a melting peak temperature of 210-250° C (e.g. polybutylene terephthalate) in a weight mixing ratio of 3/7-7/3 so that the obtained mixture may have a melting peak temperature of 205-235°C and that there may be a difference of at least 60°C between the extrapolated final melting temperature presumably corresponding to the final flow temperature and the extrapolated initial melting temperature presumably corresponding to the initial flow temperature.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] Since this invention consists of a heat-resistant resin constituent excellent in the nonwoven fabric which comes to use the fiber which has the heat weld ability obtained using the resin constituent for heat weld which heat weld was easy for and was excellent in thermal resistance, and this resin constituent, and the adhesive property of the member comparatively **(ed) under an elevated temperature (for example, 160-230 degrees C), without being accompanied by degradation of the work environment according to a solvent and others in more detail, and this resin constituent and is **(ed) by the elevated temperature like a built-up-roofing base fabric When it is used as adhesives of many nonwoven fabrics for industrial materials base fabrics with which correspondence force dimensional stability is demanded at the time of heat-resistant high **********, a heat-resistant high nonwoven fabric is offered by the product physical properties which were excellent without contamination of a work environment in high productivity.
[0002]
[Description of the Prior Art] In the latest environment which surrounds an adhesives related industry, the high productivity-ized demand of exclusion of the air (environment) contamination accompanying solvent evaporation of the adhesives which contain the conventional solvent with the upsurge of the improvement demand in productivity and improvement demand advance of a work environment and speeding up of adhesion, laborsaving, etc. rises, the need of heating weld adhesives, i.e., hot melt adhesive, is evoked, and Kamiichi of much hot melt adhesive has come to be carried out.
[0003] It is requirements that adhesive strength with an adapter-ed is securable with the fluidity (viscosity) for which it was suitable in pasting up an adapter-ed, without fusing the indispensable demand physical properties required of these hot melt adhesive by the about 100-180-degree C temperature requirement, and receiving big degradation. Various goods to which a demand function is satisfied are manufactured and sold by using various random copolymers in many cases, since there are many demands to the ability to paste up comparatively generally in a low-temperature region, making the copolymerization composition change suitably, in order to make it correspond to the operating-condition temperature demanded, and setting polymerization degree to reservation of the flowability under an operating condition suitably.
[0004] Therefore, although these hot melt adhesive was the adhesives as high productivity and expected [which solve the problem of environmental pollution], since maintenance of adhesive strength was comparatively performed only in a low-temperature field on the character, the **** condition range of the article pasted up with hot melt adhesive had the view given up although it was comparatively restricted to the low-temperature field, and it common-sense-ized and there was need of improvement in **** temperature conditions.
[0005] On the other hand, it is even if it sets in a nonwoven fabric manufacture process. Sinking [of the emulsion adhesives conventionally used abundantly] in, drawing, the energy efficiency of the process which pastes up by dryness, How to make a nonwoven web carry out distributed spraying, and to make it carry out heat weld of the hot melt adhesive by the shape of powder from the badness of productivity, the badness of a work environment, etc., [whether a nonwoven fabric web is made to constitute from bicomponent-fiber itself which used hot melt adhesive as the adhesion component, and] The so-called introduction of the method of manufacturing the nonwoven web which interwove these bicomponent fibers, and carrying out heat weld, or the thermal bond method which carries out heating weld of the nonwoven web which interwove the adhesion fiber which consists of hot melt adhesive has come to be performed briskly.
[0006] The nonwoven fabric manufacture process by these thermal bond method, Although there were many merits -- heat-sealing nature can give -- in the nonwoven fabric which the problem of high productivity and environmental pollution can solve, and the effect as expected is acquired, and is formed by the bicomponent fiber 100 more%, although the **** condition range of the character up product was comparatively restricted to a low-temperature field, and it common-sense-ized it and it had the need of improvement in **** temperature conditions, it had the view by which the improvement was given up.
[0007]
[Problem(s) to be Solved by the Invention] The purpose of this invention is as follows. Improve the defect to which a use is limited low, the fatal technical problems, i.e., the **** temperature conditions, which these hot melt adhesive has, and raise the upper limit of **** temperature conditions even near the practical use heatproof temperature of the plastic stake which is an adapter-ed, and an organic synthetic fiber. Things. Excel in the thermal resistance in which adhesion of the nonwoven

fabric which consists of adhesion and the organic synthetic fiber of plus FUIKU is raised without being accompanied by the fall of workability, and it deals, and offer the nonwoven fabric using the resin constituent for heat weld with easy heat weld, and this resin constituent for heat weld. That is, this invention offers conventionally the resin constituent for heat weld excellent in the thermal resistance which can paste up the product of the 160-230-degree C comparatively high field of the **** temperature conditions impossible [sensibly] and made into the outside of an object, and the high nonwoven fabric of the heat-resistant high **** temperature conditions of coming to use this constituent, by adhesion by hot melt adhesive, holding the so-called high productivity of the thermal bond method for using hot melt adhesive, and the merit of pollution exclusion of a work environment.

[0008]

[Means for Solving the Problem] this invention takes the following means, in order to solve the aforementioned technical problem.

[0009] The dissolution peak temperature (Tpm) which carries out [temperature] melting mixture and is obtained by the rate 3 / 7 - 7/3 is 205-235 degrees C. namely, the random copolymerized polyester whose dissolution peak temperature (Tpm) of this invention is 200-230 degrees C and the polyester whose dissolution peak temperature (Tpm) is 210-250 degrees C -- a weight -- a mixing ratio -- And let the resin constituent for heat weld excellent in the thermal resistance characterized by the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) being 60 degrees C or less be the means.

[0010] Moreover, the random copolymerized polyester whose percentage of this organic dibasic acid this invention serves as ethylene glycol and terephthalic acid from the organic dibasic acid more than a kind at least, and is 3-20-mol %, The dissolution peak temperature (Tpm) which carries out melting mixture and obtains the weight mixture ratio 3 of a polybutylene terephthalate / mixture of 7 - 7/3 at 205-235 degrees C And let the resin constituent for heat weld excellent in the thermal resistance characterized by the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) being 60 degrees C or less be the means.

[0011] furthermore, the thermal resistance whose polyester with a dissolution peak temperature of 210-250 degrees C of this invention is a polybutylene terephthalate in a claim 1 -- let the excellent resin constituent for heat weld be the means

[0012] Moreover, the dissolution peak temperature (Tpm) which this invention carries out melting mixture of the mixture of the crystalline polyester more than a kind at least with the gay polyester of crystalline low dissolution peak temperature with a dissolution peak temperature (Tpm) of 235 degrees C or less, and obtains it is 205-235 degrees C. And let the resin constituent for heat weld excellent in the thermal resistance characterized by the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) being 15-60 degrees C be the means.

[0013] Furthermore, let the resin constituent for heat weld excellent in the thermal resistance which this invention makes a polybutylene terephthalate a principal component, and is characterized by for the dissolution peak temperature which carries out melting mixture and obtains the mixture of the gay polyester which has the dissolution peak temperature (Tpm) of 230 degrees C or less more than a kind at least being 205-235 degrees C, and the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) being 15-60 degrees C be the means.

[0014] Furthermore, this invention makes the means the nonwoven fabric which comes to carry out heating weld of the nonwoven nature web which was bicomponent-fiber independent [from which the dissolution peak temperature (Tpm) which makes a principal component 15 - 50 % of the weight of resin constituents, and the polyethylene terephthalate or polyethylene terephthalate of claims 1, 2, 3, 4, or 5 carries out compound spinning of the 85 - 50 % of the weight of the random copolymerized polyester 240 degrees C or more, and obtains it], or was mixed 15% of the weight or more, and obtained this bicomponent fiber.

[0015] Furthermore, this invention makes the means the nonwoven fabric which comes to carry out heating weld of the nonwoven nature web which was mixed five to 25% of the weight, and obtained the fiber which has the heat weld ability obtained using the resin constituent for heat weld of claims 1, 2, 3, 4, or 5.

[0016] this invention is explained in detail below. It is required in carrying out a difference with the extrapolation dissolution start temperature (Ti) which is generally considered and is considered to correspond to the extrapolation dissolution end temperature (Te) and the flow beginning temperature considered to be unable to be satisfied only with the selection of adhesives with high **** dissolution peak temperature (Tpm) currently performed conventionally, and to correspond to flow end temperature with high dissolution peak temperature in order to obtain the high adhesives of the **** temperature conditions made into the purpose in this invention as 60 degrees C or less.

[0017] And while carries out melting mixture and the dissolution peak temperature (Tpm) of copolymerized polyester must be 200-230 degrees C. When dissolution peak temperature (Tpm) becomes less than 200 degrees C, Tpm of the polyester of another side is 210 degrees C, Tpm of the mixed polymer becomes less than 205 degrees C, and surpasses 230 degrees C of another side preferably and Tpm of the polyester of another side is 250 degrees C, Tpm of the mixed polymer will surpass 235 degrees C, and is not desirable. What considered as the acid component by having made terephthalic acid and ethylene glycol into the subject as an example of random copolymerized polyester, and copolymerized butanediol or its derivative as an isophthalic acid, the organic dibasic acid more than a kind, its derivative, or an alcoholic component is raised.

[0018] On the other hand, about the polyester whose dissolution peak temperature (Tpm) is 210-250 degrees C, when it becomes less than 210 degrees C, and Tpm of random copolymerized polyester is 200 degrees C, Tpm of a resin constituent becomes less than 205 degrees C, and surpasses another side and 250 degrees C preferably and Tpm of random

copolymerized polyester is 230 degrees C, Tpm of a resin constituent surpasses 235 degrees C and is not desirable. This polyester may be a polybutylene terephthalate.
[0019] here -- the aforementioned random copolymerized polyester and polyester -- a weight -- a mixing ratio -- melting mixture is carried out by the rate 3 / 7 - 7/3, dissolution peak temperature (Tpm) is 205-235 degrees C, and the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) serves as a resin constituent for heat weld excellent in the thermal resistance of 60 degrees C or less in addition -- if the effect of random copolymerized polyester becomes less remarkable when a ratio becomes less than 3/7, adhesion time becomes long and another side 7/3 is surpassed preferably -- the adhesion after adhesion and under an elevated temperature -- those powerful with a fall -- it is not desirable It becomes [**** temperature] that dissolution peak temperature (Tpm) is less than 205 degrees C with less than 200 degrees C and is not desirable. If 235 degrees C of another side are surpassed, the difference of dissolution peak temperature becomes [become less than 30 degrees C and / an adhesion temperature setup] difficult and is not desirable.
[0020] Moreover, the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) must be 60 degrees C or less. Less than 200 degrees C or extrapolation dissolution end temperature has extrapolation dissolution start temperature [good] for 250 degrees C, and this is not suitable as an adhesion component. As a raw material of the resin constituent the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) is desirable 60 degrees C or less, and the above and 15-60 degrees C (Tpm) of whose dissolution peak temperature are 30-60 degrees C still more preferably at 205-235 degrees C, the mixture of the gay polyester of crystalline low dissolution peak temperature with a dissolution peak temperature (Tpm) of 235 degrees C or less and at least one or more sorts of crystalline polyester is mentioned. This mixture has a desirable polybutylene terephthalate etc. from the reason of the conformity to the above-mentioned conditions by the difference of dissolution peak temperature, extrapolation dissolution start temperature, and extrapolation dissolution end temperature.
[0021] by the way, the fiber for which the dissolution peak temperature (Tpm) which makes a principal component 15 - 50 % of the weight of resin constituents which described the nonwoven fabric of this invention till now, and a polyethylene terephthalate or a polybutylene terephthalate has the heat weld ability obtained using the bicomponent fiber which carried out compound spinning of the 85 - 50 % of the weight of the random copolymerized polyester 240 degrees C or more, and was obtained, and the resin constituent described till now -- independent -- or 15% of the weight or more, it mixes five to 25% of the weight, and is obtained, respectively
[0022] As a means made into a nonwoven fabric, the so-called span bond method, the melt blowing method, the web method, etc. may be raised, and you may be any of a continuous glass fiber and a staple fiber. Furthermore, the nonwoven fabric excellent in thermal stability with a good adhesion state is obtained by heating weld, for example, a calender method, the press method, the hot blast method, etc.
[0023]
[Example]
Carry out dissolution mixture of the resin constituent of Table 1 by the extruder in examples 1-4 and the 1-3 span bond process of examples of comparison. the sheath component of a sheath-core bicomponent fiber -- using -- a heart component -- the polyethylene terephthalate of limiting viscosity 0.65 -- using -- component ratio =2/8 of a sheath/heart -- 280 degrees C -- a 0.35mm orifice -- spinning was carried out in a part for 1.33g/of solitary-foramen discharge quantity, it shook off and web-ized with jet after extension by 5 times as many draw magnification as this from the hole, and, similarly the physical properties of the nonwoven fabric obtained after carrying out thermal bond at the temperature of Table 1 were shown In addition, similarly physical properties when a sheath component separates from requirements for comparison were shown.
[0024]
[Table 1]

種別 / 項目 / No			実施例				比較例		
			1	2	3	4	1	2	3
樹脂組成物	第一成分	テレフタル酸	88	88	84	80	84	83	100
		イソフタル酸	12	12	16	20	16	17	0
		エチレングリコール	100	100	100	100	100	100	100
	第二成分	テレフタル酸	100	100	100	100	100	—	100
		ブタンジオール	100	100	100	100	100	—	100
	混合比率(重量%)	第一成分	70	50	50	60	50	100	50
		第二成分	30	50	50	40	50	0	50
	融解ピーク温度(℃)		233	227	223	211	168	223	202
	補外融解開始温度(℃)		202	184	185	161	135	163	138
	補外融解終了温度(℃)		232	235	240	220	195	232	210
	同上の差		30	51	55	59	60	69	72
不織布	接着状態		良好				良好		不良
	高温時ウエブモジュラス (kg／5cm)		7.8	6.5	6.3	5.3	1.2	2.5	1.9

[0025] In addition, measurement of the physical properties in Table 1 was based on the following method.
** Dissolution peak temperature : use differential hot **** (DSC) of SEIKO SS 5000 CORP., heat 2mg of samples by 5-degree-C programming rate for /, and say the temperature (degree C) of the endothermic peak by dissolution.
[0026] ** Extrapolation dissolution start temperature : consider as the temperature of the intersection of the straight line which extended the base line by the side of low temperature to the elevated-temperature side, and the tangent drawn in that grade becomes the maximum at the curve by the side of the low temperature of a dissolution peak.
[0027] ** Extrapolation dissolution end temperature : consider as the temperature of the intersection of the straight line which extended the base line by the side of an elevated temperature to the low temperature side, and the tangent drawn in that grade becomes the maximum at the straight line by the side of the elevated temperature of a dissolution peak. When two or more dissolution peaks appear independently, it asks about each peak, and when a peak laps and two or more pieces exist, two or more values are calculated.
[0028] ** the time of an elevated temperature -- web modulus (kg / 5cm): -- measure the stress when elongating width of face of 5cm, and a length (effective) of 10cm 5% under 200 degrees C by the III type tensilon of Oriental Baldwin, Inc. by part for

20cm/of speeds of testing, and express with the average of n= 5
[0029] In Table 1, it was the example which used the polymer which mixed butanediol with isophthalic-acid copolymerized polyester for the sheath component, and the sheet state after adhesion was also good, stress was also high at the time of 5% extension under the elevated temperature of 200 degrees C, and, as for examples 1-4, the problem did not have the permeability in a post-processing process, either.
[0030] On the other hand, in the example 1 of comparison, although the dissolution peak temperature of a sheath component was low and the adhesion state in ordinary temperature was good, under the elevated temperature, the pasting up point separated and physical properties fell greatly. In the example 2 of comparison, although there was no problem in the dissolution peak temperature of a sheath component, since a crystalline ester component did not exist, the pasting up point blank under an elevated temperature happened. In the example 3 of comparison, since there was no copolymerization ester component conversely, in usual adhesion time, it could not fuse but became an adhesive agent.
[0031]
[Effect of the Invention] Heat weld is easy for this invention, and it is excellent in thermal stability, and the sheet state using the resin constituent for heat weld excellent in thermal resistance and this resin constituent for heat weld is also good, stress's is high at the time of 5% extension, and does so the effect that the nonwoven fabric excellent in post-processing process permeability can be obtained.

[Translation done.]

* NOTICES *

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2. **** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] the random copolymerized polyester whose dissolution peak temperature (Tpm) is 200-230 degrees C, and the polyester whose dissolution peak temperature (Tpm) is 210-250 degrees C -- a weight -- a mixing ratio -- the resin constituent excellent in the thermal resistance characterized by for the dissolution peak temperature (Tpm) which carries out melting mixture and is obtained by the rate 3 / 7 - 7/3 to be 205-235 degrees C, and for the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) to
[Claim 2] The random copolymerized polyester whose percentage of this organic dibasic acid it becomes ethylene glycol and terephthalic acid from the organic dibasic acid more than a kind at least, and is 3-20-mol %, a weight with a polybutylene terephthalate -- a mixing ratio -- at 205-235 degrees C, the dissolution peak temperature (Tpm) which carries out melting mixture and obtains a rate 3 / mixture of 7 - 7/3 And the resin constituent for heat weld excellent in the thermal resistance characterized by the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) being 60 degrees C or less.
[Claim 3] the thermal resistance whose polyester with a dissolution peak temperature of 210-250 degrees C is a polybutylene terephthalate in a claim 1 -- the excellent resin constituent for heat weld
[Claim 4] The resin constituent for heat weld excellent in the thermal resistance characterized by for the dissolution peak temperature (Tpm) which carries out melting mixture of the mixture of the crystalline polyester more than a kind at least with the gay polyester of crystalline low dissolution peak temperature with a dissolution peak temperature (Tpm) of 235 degrees C or less, and is obtained being 205-235 degrees C, and the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) being 15-60 degrees C.
[Claim 5] The resin constituent for heat weld excellent in the thermal resistance which makes a polybutylene terephthalate a principal component and is characterized by for the dissolution peak temperature which carries out melting mixture and obtains the mixture of the gay polyester which has the dissolution peak temperature (Tpm) of 230 degrees C or less more than a kind at least being 205-235 degrees C, and the difference of extrapolation dissolution end temperature (Te) and extrapolation dissolution start temperature (Ti) being 15-60 degrees C.
[Claim 6] The nonwoven fabric which comes to carry out heating weld of the nonwoven nature web which was bicomponent-fiber independent [from which the dissolution peak temperature (Tpm) which makes a principal component 15 - 50 % of the weight of resin constituents, and the polyethylene terephthalate or polybutylene terephthalate of claims 1, 2, 3, 4, or 5 carries out compound spinning of the 85 - 50 % of the weight of the random copolymerized polyester 240 degrees C or more, and obtains it], or was mixed 15% of the weight or more, and obtained this bicomponent fiber.
[Claim 7] The nonwoven fabric which comes to carry out heating weld of the nonwoven nature web which mixed 95 - 75 % of the weight of fiber of 5 - 25 % of the weight, and other high-melting points, and obtained the fiber which has the heat weld ability obtained using the resin constituent for heat weld of claims 1, 2, 3, 4, or 5.

[Translation done.]

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ABSTRACT:

PURPOSE: To obtain a resin composition which can easily perform hot melt bonding and is excellent in heat stability and heat resistance by performing specified melt mixing so that the obtained mixture may have a high melting peak temperature and a specified difference between the extrapolated final melting temperature and the extrapolated initial melting temperature.

CONSTITUTION: The resin composition which can easily perform hot melt bonding and is excellent in heat stability and heat resistance is prepared by melt-mixing a random copolyester of a melting peak temperature of 200-230°C (e.g. a copolymer based on terephthalic acid and ethylene glycol and prepared by copolymerizing an acid component such as isophthalic acid with an alcohol component such as butanediol) with a polyester of a melting peak temperature of 210-250°C (e.g. polybutylene terephthalate) in a weight mixing ratio of 3/7-7/3 so that the obtained mixture may have a melting peak temperature of 205-235°C and that there may be a difference of at least 60°C between the xtrapolated final melting temperature presumably corresponding to the

final flow temperatur and th extrapolated initial melting temperature presumably corresponding to the initial flow temperature.